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Moving Forward With Complementary Feeding: Indicators and Research Priorities

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Development of successful interventions to improve child-feeding practices requires appropriate instruments to assess current practices and monitor the impact of programs designed to improve them. Simple, valid, and reliable tools are lacking to measure child feeding in the context of program development, for the purposes of (1) assessment, (2) design and targeting of intervention programs, and (3) monitoring and evaluating their progress. The problem of measurement arises primarily because child-feeding practices encompass a series of age-specific, interrelated behaviors that are difficult to summarize into one or a few variables.

The main objectives of this report are to review and discuss possible indicators of adequate or optimal complementary feeding practices as they relate to children ages 6–23 months and to describe steps in validating and assessing the utility of these potential indicators for various purposes.

Characteristics and Performance Criteria of Indicators

Indicators are data collected through measurement, observation, or interview that describe an underlying phenomenon. In the case of complementary feeding practices, indicators are required to characterize caregiver behaviors related to feeding and the child's usual dietary intake.

In developing a set of possible indicators, the authors consider key performance issues, such as validity, reliability, and responsiveness. They also discuss main threats to indicator performance, namely systematic biases and reactivity (which affect both validity and reliability), and random error and intra-individual and day-to-day variability (which affect reliability). The authors also discuss several aspects related to the application of the indicators and discuss the strengths and weak-nesses of different data collection approaches.

This paper proposes a series of possible indicators to assess adequacy of complementary feeding practices and identifies research priorities.

Current Recommendations and Possible Indicators of Adequacy of Complementary Feeding Practices

In 1998, the World Health Organization (WHO)/UNICEF developed a technical document to establish energy and nutrient requirements from complementary foods (CF) for the breastfed child, which was updated in 2003 by Dewey and Brown. A set of "Guiding Principles" was then developed by the Pan American Health Organization (PAHO)/WHO to guide programs aimed at improving complementary feeding practices.

The present document proposes a series of indicators based on these "Guiding Principles," and focuses on the following practices: breastfeeding duration and frequency, energy and nutrient density of CF, safe preparation and storage of CF, and care during feeding. The indicators proposed apply to 6-to-23-month-old breastfed children and are to be used for population, as opposed to individual-level inferences. In each case, the authors discuss the most precise indicators and measurement approaches and then propose proxy indicators that might be easier to collect and thus potentially more useful for programs and large-scale surveys.

Examples of proposed indicators for the different dimensions of complementary feeding practices are as follows:

- **Breastfeeding***: percent of 6-23-month-old children breastfed yesterday.* (Note: other age groupings such as 3-month or 6-month intervals can be used if sample sizes allow; this indicator is based on maternal recall during the previous 24 hours).
- **Energy intake**: *Average energy density of main CF fed to children 6-8 and 9-11 months of age, respectively.* (Note: This indicator is based on data collected at the group- or community-level, using group recipe trials).
- **Feeding frequency**: *percent of children 6-8 months and 9-23 months fed CF at least twice, and three times a day, respectively*. (Note: This indicator is based on maternal recall, usually for the previous 24 hours. Intake of snacks should also be measured and an indicator of snacking frequency can be used).
- **Nutrient adequacy**: *(1) percent of children 6-23 months old who consumed in previous 24 hours: (a) animal products; (b) dairy products; (c) vitamin A-rich foods; (d) fortified products. (2) Mean number of foods (or food groups) consumed in previous 24 hours (an indicator of dietary diversity).* (Note: these indicators are based on the assumption (still to be verified) that dietary diversity and/or intake of specific groups of nutrient-dense foods predict nutrient density of the diet).
- **Safe preparation and storage of CF:** a series of indicators related to hand-washing, safe storage and re-

warming of cooked foods, use of clean utensils to prepare and serve food to the child, avoidance of baby bottles and use of safe water is proposed. (Note: collection of hygiene information based on recall is highly subject to systematic biases resulting from overreporting of good practices, because most populations have a least some knowledge of appropriate hygiene practices).

- **Care during feeding:** Two types of indicators are proposed to measure care during feeding. Indicators to assess: (1) feeding styles (responsive, controlling, laissez-faire behaviors); and (2) psychosocial care during feeding, as defined in the "Guiding Principles" (e.g., feed infants directly and assist older children, be responsive to hunger and satiety cues, feed slowly and patiently, encourage the child to eat, utilize various strategies when child refuses to eat, feed in a protective environment, etc.).

Research and Indicator Validation Priorities

The paper concludes by highlighting research priorities to validate the suggested indicators.

- *For breastfeeding frequency*: *Research* is needed to assess whether feeding frequency accurately differentiates between children with low versus high breast milk intake. Research should also test the accuracy of recall compared to observational approaches.
- *For energy intake from CF*: The group recipe trial method proposed to assess average energy density of main CF needs to be validated. Variability within and between recipes, households, and population groups needs to be assessed. The underlying assumption that infants 6-11 months of age receive most of their energy from few CF also needs to be verified in a variety of contexts.
- *Feeding frequency*: Recall methods to assess feeding frequency should be validated against observations. Recall methods to accurately differentiate between snacks and meals should also be developed.
- *Nutrient adequacy:* The usefulness of dietary diversity measures to predict nutrient adequacy of CF needs to be validated. A number of methodological aspects still need to be addressed to design accurate and reliable dietary diversity indicators for CF.
- *Safe preparation and storage of CF*: The main research need in this area is to assess the validity of recall approaches and to try to design rapid observational methods such as spot check instruments that would minimize recall biases.
- *Care during feeding:* There is an urgent need to develop and validate indicators of feeding behaviors within the context of psychosocial care during feeding. Indicators based on caregiver recall need to be developed and tested against structured observations.

Conclusion and Discussion

This report highlights the need to carry out a wide range of validation studies to accelerate progress in developing simple and useful indicators of complementary feeding. A number of existing data sets could be used to address most of the indicator validation needs identified here. Research to develop and validate simple tools to assess the crucial psychosocial care aspects of complementary feeding is also urgently needed.

Keywords: breastfeeding practices, complementary feeding practices, indicators, psychosocial care, hygiene, dietary diversity

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